

**REMARKS**

This amendment is re-submitted in response to the Notice of Non-Compliant Amendment dated May 7, 2004.

The decision on appeal stated that the Juang reference fully meets the invention as claimed in claim 9. Applicant argued that the system described in Juang operates to transform input speech and does not transform a speech model or a speech signal source representation. In the examiner's and the appeal board's opinion the conversion of the input speech signal to a series of feature vectors by feature analyzer results is a "speech signal representation" as claimed. The board takes a broader view of the meaning of the words "signal source representation" to include what is in the reference. The Juang still does not transform a speech recognition model. Applicant's claims herein clearly claim providing initial speech recognition models and performing a set transformations on the initial speech recognition models or on following new speech recognition models and therefore not anticipated by the Juang reference.

Applicant's new claim 11 calls for:

"A method of source normalization for modeling of speech comprising the steps of: providing an initial speech recognition model and performing a set of transformations on said initial speech recognition model or following new speech recognition models to reduce the recognition error rate by determining new speech models and determining new transformations jointly with the new speech models."

Applicant believes therefore in view of the new the new claim 11 it is clearly patentable over the Juang reference.

Applicant's claim 12 dependent on Claim 11 is deemed allowable for at least the same reasons as claim 11. Claim 12 further calls for "said set of transformations includes an application of an estimation maximization algorithm."

Claim 13 calls for "An improved speech recognition system comprising:

a speech recognizer; and

a source normalization model coupled to said recognizer for recognizing incoming speech;

said model derived by a method of source normalization training for HMM modeling of speech comprising the steps of:

providing an initial speech recognition model;

performing on said initial speech recognition model or following new speech recognition models transformation steps to get a new speech recognition model to reduce the recognition error rate by determining new speech recognition models and determining new transformations jointly with new speech recognition models; said transformation steps including application of estimation maximization algorithm."

This is not taught in Juang.

Claim 14 calls for: "An improved speech recognition system comprising:

a speech recognizer; and

a source normalization model coupled to said recognizer for recognizing incoming speech; said model derived by a method of source normalization training for HMM modeling comprising the steps of:

a) providing an initial speech recognition model and

b) performing on said initial speech recognition model the following steps to get a new speech recognition model:

- b<sub>1</sub>) estimation of intermediate quantities;
- b<sub>2</sub>) performing re-estimation to determine probabilities;
- b<sub>3</sub>) deriving mean vector and bias vector; and
- b<sub>4</sub>) solving jointly for mean vector and bias vector.”

Clearly this is not taught in the Juang reference.

Claim 15 is deemed allowable for at least the same reasons as Claim 14. Claim 15 further calls for “The recognizer of Claim 14 including the step b<sub>5</sub>) of replacing old speech recognition model for the calculated ones and step c ) determining after a new speech recognition model is formed if it differs significantly from the previous speech recognition model and if so repeating the steps b<sub>1</sub>-b<sub>5</sub>.”

Claim 16 calls for “The recognizer of claim 14 wherein said step b<sub>2</sub> includes one or more of performing re-estimation to determine initial state probability, transition probability, mixture component probability and environment probability. “ This is clearly not taught in Juang or the other cited references.

Claim 17 calls for “said step b<sub>2</sub> includes performing re-estimation to determine initial state probability, transition probability, mixture component probability and environment probability.” This is clearly not taught in the Juang or other cited references.


Claim 18 calls for “The recognizer of claim 14 wherein said step b<sub>4</sub> includes solving jointly for mean vector and bias vector using linear equations and determining

variances and transformations.” Clearly this is not taught by the Juang or other references.

The other newly added claims are clearly patentable over Juang and the other references for at least the same reasons as discussed above.

In view of the above applicant’s new added claims 11-27 is deemed in condition for allowance and an early notice of allowance is respectfully requested

Respectfully submitted;

A handwritten signature in cursive script, reading "Robert L. Troike".

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